

Joist Holder

The present invention relates to a holder for a joist.

Traditionally there have been two ways of mounting joists on walls. One solution is to use a galvanised metal 'hanger' that has the appearance of a triangular box with an anchor portion that extends back across the part of the wall to which the joist is to be connected. These hangers are generally regarded as unsatisfactory because they frequently cause the underlying portion of the wall to crumble and this results in uneven floors. The other conventional method is simply to build the joist into the wall, but recent British building regulations specify that there must be a watertight seal between the joist and the wall as otherwise moisture from the wall can cause the joists to rot. The current common methods of complying with this requirement are either to wrap the joist in damp proof course material or to apply a silicon sealant between the joist and the wall. However, these are considered to be very time-consuming operations and the cost of the silicon sealant is relatively high.

Embodiments of the present invention are intended to provide an alternative to these existing approaches and reduce or mitigate their associated problems.

According to a first aspect of the present invention there is provided a joist holder including a preformed sleeve of water impermeable material for receiving one end of a joist, the sleeve being mountable on a wall.

One end of the sleeve may have a base portion so that the holder forms a box with one open end.

A flange may extend transversely from one or more edges of the open

end of the sleeve. In use, the flange may abut the surface of the wall into which the joist is inserted. The flange may include one or more apertures for screws or the like. The width of the flange may be around 25 to 75 millimetres.

5 In some embodiments the outer surface of the sleeve may include protrusions or ridges in order to improve adhesion to cement or the like on the wall.

The holder may be dimensioned to substantially correspond to dimensions of standard joists. For example, the dimensions of the rectangular sleeve may be suitable for fitting around the end of a 225 millimetre x 47
10 millimetre standard rectangular joist. Often the joist will be slightly larger than the intended standard dimensions and so suitable dimensions for the holder will be around 230 mm x 50 mm. It will be appreciated that these dimensions can be modified to fit joists of other standard (or non-standard) dimensions.

The joist holder may be formed of metal or plastic material. In one
15 embodiment the holder is formed of galvanised steel which is then coated with an elastomeric material such as rubber. The coating may be applied by dipping.

The depth of the sleeve may correspond to the depth of a standard building block or brick. In use, the height of the holder may generally correspond to the expected height of one or more building units. For example,
20 the height of the holder may correspond to the expected height of three bricks and associated layers of cement, or the height of the holder may correspond to the expected height of one block and associated layer of mortar.

The holder may include an extension of an end wall of the sleeve to assist with bearing the load of a joist in use. The extension may include one or more

apertures to allow screws or the like to fix the underside of a joist to the extension in use.

The sleeve may be at least partially formed of transparent or semi-transparent material. In one embodiment, at least one end wall of the sleeve
5 includes a panel formed of transparent or semi-transparent material.

The holder may be formed of, or coated with, fire and/or smoke and/or fume resistant material.

At least one sidewall of the sleeve may include an aperture, in use, the aperture being used to allow a fixing device, such as nail, to be inserted through
10 the sleeve to a joist fitted in the holder. The aperture may be located about midway across the width of the sidewall(s). In one embodiment, opposing sidewalls of the sleeve each include an aperture, one or the apertures being offset horizontally and/or vertically from the other aperture.

According to a further aspect of the invention there is provided a kit for
15 mounting a joist in a wall including a holder substantially as described herein, and a substantially L-shaped bracket, in use, one portion of the bracket being fixed to the wall and another portion of the bracket being fixed to a side surface of a joist inserted into the holder.

According to another aspect of the present invention there is provided a
20 method of mounting a joist in a wall including steps of:

inserting an end of a joist into a preformed water-impermeable sleeve,
and

mounting the sleeve onto the wall.

The inserting step may take place before the mounting step (in which

case a step of inserting a fixing device through an aperture in the sleeve and into the joist may take place after the inserting step), or vice versa.

The method may further include a step of placing wall-building materials around and/or on top of the sleeve.

5 The method may include a step of further securing the sleeve to the wall, e.g. by inserting screws through a flange extending around one end of the sleeve to fix the sleeve to the wall.

 The method may further include steps of fixing one portion of a substantially L-shaped bracket to the wall and fixing another portion of the
10 bracket to a side surface of the joist inserted into the holder.

 According to a further aspect of the present invention there is provided a method of mounting a joist including steps of:

 positioning a joist end into a water-impermeable preformed sleeve, and
 locating the sleeve in a course of building blocks or the like,
15 wherein the steps of positioning and locating can be performed in either order.

 According to yet another aspect of the present invention there is provided a sleeve for a joist comprising a water impermeable preformed wall for at least partially encircling an end of the joist for preventing water penetration to the joist
20 end, wherein the sleeve is dimensioned to have a depth approximately equal to a standard building block, the sleeve further including an anchor portion for anchoring to the face of a block work wall.

 According to a further aspect of the present invention there is provided a building structure including joists mounted by means of a joist holder

substantially as described herein.

According to a further aspect of the present invention there is provided an assembly including a joist and a joist holder substantially as described herein.

5 The invention may be performed in various ways, and, by way of example only, embodiments thereof will now be described, reference being made to the accompanying drawings, in which:-

Figure 1 is a perspective view of one embodiment of the joist holder;

Figure 2 illustrates schematically the holder mounted in a wall;

10 Figure 3 illustrates schematically a plan view of another embodiment of the holder being used to mount a joist in a wall, and

Figure 4 illustrates schematically another embodiment of the holder.

15 Referring to Figure 1, the joist holder 100 comprises a rectangular tubular sleeve 102 with one open end of the sleeve being closed by means of a base plate (indicated at 104). Thus, the holder 100 has the general appearance of a box with one open end that allows access to a cuboid-shaped internal space 106. In some embodiments, the base plate 104 may be a separate component that is attached to the end of the joist/sleeve during installation. It will be appreciated that variations to the design shown in Figure 1 can be made, e.g. having curved edges at the corners of the sleeves, the sleeve having tapering
20 walls, and the like.

The depth of the sleeve 102 can correspond to that of a standard building block or brick. In one example the depth of the sleeve is around 100 millimetres, although it will be appreciated that this dimension could be varied in accordance with any particular construction requirements. Joists come in a range of

standard sizes, normally: 102 x 47 millimetres; 127 millimetres x 47 millimetres; 152 x 47 millimetres; 203 x 47 millimetres and 228 millimetres x 47 millimetres. The sleeve 102 can be dimensioned in order to securely fit around the end of a joist having any of these dimensions (or any other non-standard dimensions). It will be appreciated that the dimensions of the space 106 inside the holder will often be slightly larger than the dimensions of the joist to be fitted inside it.

Extending around the open end of the sleeve 102 is a rectangular flange 108. The width of the flange extending from the rim of the sleeve can be in the range of 25 to 75 millimetres. In alternative embodiments, a flange only extends from one or some of the four edges of the sleeve. The flange 108 includes a plurality of apertures 110, e.g. located at corner and central locations on the flange.

In the example holder 100 of Figure 1, the base portion 104, the rectangular sleeve 102 and the flange 108 are formed of separate sheets of metal that have been welded together. It will be appreciated that other methods and materials can be used to form the holder. For example, the holder can be formed of one or more piece of moulded plastic. The holder may also be coated with another material, such as rubber, which can provide increased friction with surrounding materials, thus making it more stable in use. In an alternative embodiment one or more of the outer surfaces of the sleeve 102 can include a one or more protrusions (e.g. rib-like formations), which can further improve adhesion to cement or the like. The protrusions can be straight or curved formations and can have various sizes, depth, etc and, in general, will be arranged in a pattern that is intended to provide a good grip between the holder

and mortar in use.

Referring to Figure 2, the holder 100 is shown in situ in a wall 200. The left hand side of the Figure demonstrates how the holder 100 is fitted when the wall is formed of blocks, whilst the right hand side illustrates how the holder is fitted when bricks are used. An example of how the holder can be used to mount a joist in the wall will now be described, although it will be appreciated that variations of these steps are possible.

When constructing the wall 200 using bricks, one or more lower courses of bricks 201 are formed and a layer of cement is then laid on top. The joist holder 100 is placed on top of the cement at the desired location. As shown, one of the narrow sides of the holder 100 is normally placed on the course to accommodate a joist in its conventional construction orientation. A next course of bricks 202 is then laid on top of the lower course 201, with a pair of these bricks abutting the two exposed sides of the joist holder 100. The wall continues to be built this way with two subsequent courses of bricks 203, 203 being laid adjacent to the sides of the holder 100. Each brick has a height of about 65 mm and each layer of cement is about 10 mm. Thus, the three brick courses 202 - 204 and associated cement layers have a total height of around 225mm, which corresponds to the 225/230 mm dimension of the holder 100. Subsequent course of bricks, e.g. 205, are then laid on top of the course 204 and the holder 100 so that the holder is substantially surrounded by cement and bricks.

When constructing the wall 200 using blocks, one or more lower courses of blocks 209 are formed and a layer of mortar is then laid on top. The joist holder 100 is placed on top of the mortar at the desired location. A next course

of blocks 210 is then laid on top of the lower course 209, with a pair of these blocks abutting the two exposed sides of the joist holder 100. Each block has a height of about 210 mm and the layer of mortar adds a height of about 15 mm, giving a total height of around 225mm, which again corresponds to the 225/230 mm dimension of the holder 100. Subsequent course of blocks, e.g. 211, are then laid on top of the course 210 and the holder 100 so that the holder is substantially surrounded by blocks and mortar.

The flange 108 abuts the corresponding surface of the surrounding bricks or blocks. Additional fixing means, e.g. screws through the apertures 110, can also be used to further secure the holder to the wall 200. An end of the joist is then placed into the space 106 within the holder 100.

In an alternative construction method, the holder is fitted onto the end(s) of the joist before it is mounted on the wall and the rest of the wall is then built around the holder(s) fitted with the joist.

Figure 2 also indicates how an alternative version of the holder can include a projection (shown as broken lines 215). The projection 215 can be an extension of one of the (shorter) end walls of the sleeve that is located beneath the joist in use. The projection is a substantially flat rectangular member having a length of about 100 - 200 mm and a width generally corresponding to that of the sleeve end wall/joist, e.g. around 47 mm. The projection can be an integral part of the holder, or it can be attached to it by any suitable means. The projection can assist with bearing the load of the joist. One or more apertures 217 may be present in the projection to enable screws or the like to be used to fix the projection to the underside of the joist.

Turning to Figure 3, yet another embodiment of the holder is shown. The holder can be formed (at least partially) of transparent or semi-transparent material so that the user can see how far into the internal space 106 the end of the joist 300 has been inserted. In the embodiment of Figure 3, a rectangular panel 302 is located within either or both of the end walls of the sleeve 102. The panel 302 can be made of a translucent plastic (whilst the remainder of the sleeve can be non-transparent) and is sealed to the sleeve to maintain its water-impermeable properties.

The material from which the holder is formed may be protected against fire and/or smoke and/or fumes to help improve safety if the building structure/joist were ever to catch fire. For example, the holder may be formed of a polypropylene material that can retard flames for up to around 15 minutes. Alternatively, a suitable coating may be applied to surfaces of the holder.

Figure 3 also shows an L-shaped bracket 304 that can be used along with the holder to help fix a joist in position. The bracket may be formed of a flat length of galvanised steel or other suitable material having a thickness of around 5 – 10 mm. In use, the shorter (base) portion 306 (that can have a length of around 100 – 300 mm) of the bracket is positioned so that it is adjacent/abutting the brick/blocks forming the wall. The longer (stem) portion 308 (that can have a length of around 300 – 1000 mm) of the bracket can be positioned to abut a portion of one side surface of the joist that has been fitted into the holder. The base portion of the bracket can include one or more apertures to allow screws 307 or the like to fix the bracket to the wall. Similarly, the stem portion of the bracket can include one or more apertures to allow screws or the like to fix the

bracket to the joist. Such L-shaped brackets 304 may be attached to each joist, or may only be used with certain joists, e.g. every third joist along a wall.

Figure 4 shows another embodiment 400 of the holder. The holder 400 comprises a rectangular tubular sleeve 402 with one open end (the upper end in the Figure) of the sleeve being closed by means of a base plate (indicated at 404). In contrast to the embodiment of Figure 1, the holder 400 does not include a flange that surrounds the open end of the sleeve.

One side wall of the sleeve includes an aperture 406. The aperture 406 is intended to allow a nail to be inserted through the sleeve into the joist that has been fitted into the holder. The aperture 406 is located about halfway across the width of the sidewall and is spaced apart from the edge of the sidewall adjacent the open end of the sleeve so that the holder can be installed either way up and can possibly be used with a variety of sizes of joists. It will be appreciated that one or more aperture may be present on the sleeve surface and its/their position(s) can be varied from that shown in Figure 4.

Another aperture (not shown) may be present on the opposite sidewall of the sleeve. The position of that other aperture may be offset horizontally and/or vertically from the aperture 406 so that a nail inserted through that other aperture should not contact a nail that has been inserted through aperture 406. Inserting nail(s) thorough the aperture(s) allows the holder 400 to be attached to a joist before it is positioned on the building structure. In use, the head of the nail(s) can cover the aperture(s) so that the holder remains substantially watertight.

Ribs are formed on either or both of the sidewalls (and possibly on either

or both of the end walls) of the sleeve 402. In the example, the ribs include three diagonal lines 408A, 408B, 408C that extend from near the bottom edge of the sleeve surface to near its upper edge. A (rectangular) raised area 414 that generally surrounds the aperture 406 may interrupt the rib pattern.

- 5 One or more recesses 416 may be present on the sleeve, e.g. on the base plate 404, which can be used to hold one or more corresponding plates (or the like) including product/manufacturer details, etc.